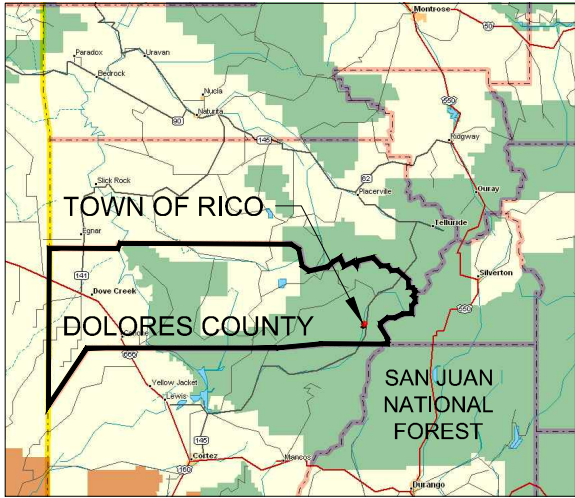
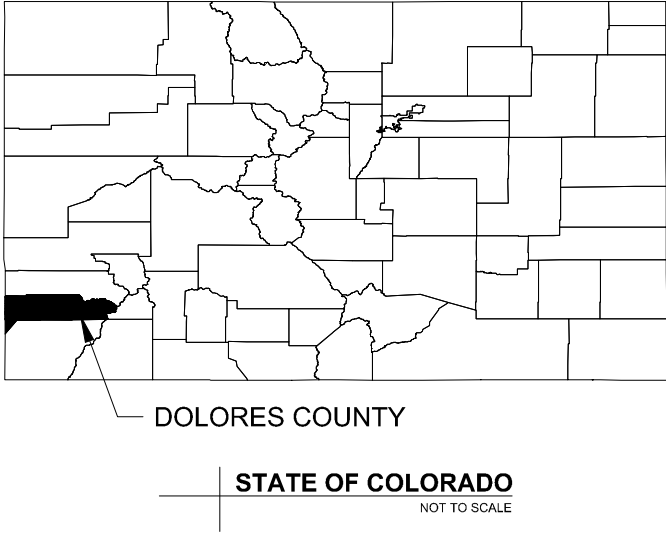


RICO-ARGENTINE SITE-OU01

ST LOUIS TUNNEL HYDRAULIC CONTROLS - STAGE 2

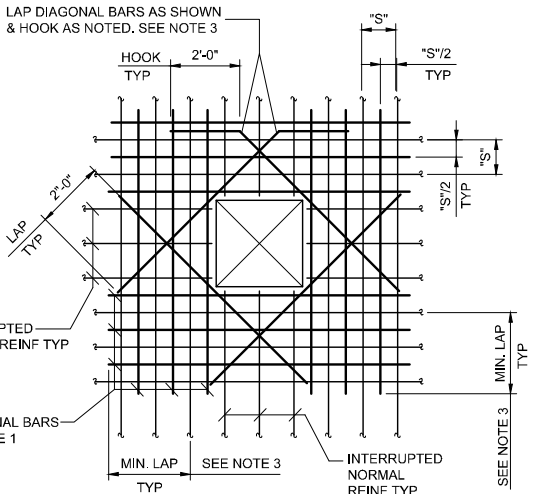
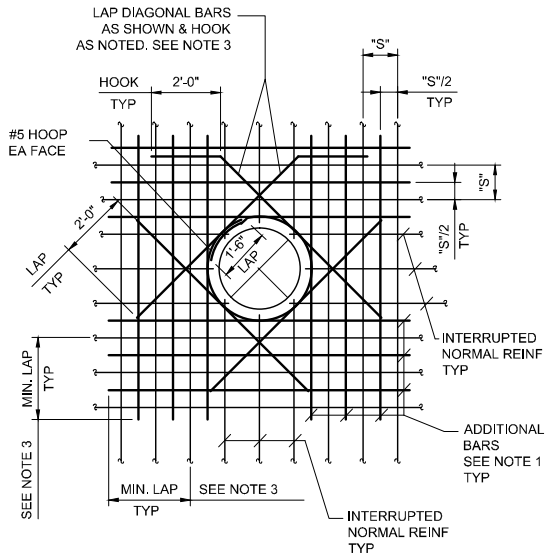


DOLORES COUNTY

NOT TO SCALE



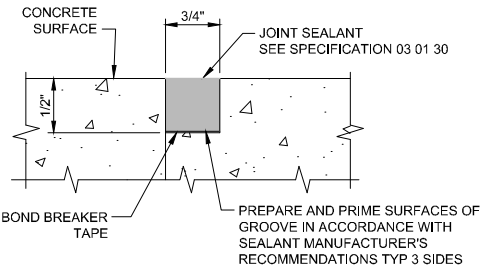
SHEET INDEX		
1	G-100	COVER SHEET
2	G-110	NOTES, LEGEND & ABBREVIATIONS
3	G-120	LAND OWNERSHIP & SURVEY CONTROL POINT PLAN
4	C-100	EXISTING SITE, UTILITIES & PRIOR EXPLORATION PLAN
5	C-110	PROPOSED SITE PLAN
6	C-120	TUNNEL DISCHARGE CONVEYANCE PLAN & PROFILE
7	C-130	TUNNEL DISCHARGE COLLECTION PLAN
8	C-140	TUNNEL DISCHARGE OUTLET CONNECTION PLAN
9	C-150	MISCELLANEOUS CIVIL SECTIONS
10	C-160	MISCELLANEOUS CIVIL DETAILS
11	C-170	INTAKE STRUCTURE DETAILS



NOTES

- NUMBER OF ADDITIONAL REINF BARS AT EA SIDE OF OPENING SHALL EQUAL HALF THE NUMBER OF INTERRUPTED BARS IN EACH LAYER OF REINF.
- SIZE OF ADDITIONAL REINF BARS TO EQUAL SIZE OF INTERRUPTED REINF BARS.
- PROVIDE STD HOOKS FOR BARS IF LAP LENGTH EXTENSION CANNOT BE OBTAINED AT JOINTS OR OTHER OBSTRUCTIONS. PLACE ADDITIONAL BARS IN SAME PLANES AS INTERRUPTED REINF.
- UNLESS NOTED OTHERWISE, SIZE OF DIAGONAL BARS SHALL BE THE SIZE OF THE LARGEST NORMAL REINF BAR CUT. LOCATE DIAGONALS IN EACH LAYER OF REINF.
- PLACE DIAGONAL BARS INSIDE NORMAL REINF.
- ALL REINF TO CLEAR OPENING OR FLANGE COLLARS BY 2".
- ADDITIONAL VERTICAL BARS, DIAGONAL BARS AND #5 HOOPS TO BE CAST IN SLAB WHERE REQUIRED (BEND BARS TO HORIZONTAL PLANE AS NEEDED).

ADDITIONAL REINFORCEMENT AROUND OPENINGS



NOTES:

- SEALANT TO BE LOCATED ON WEATHER OR WET SIDE OF WALL OR SLAB.
- HYDRAULIC STRUCTURES SHALL HAVE ALL JOINT SEALANT INSTALLED AND FULLY CURED PRIOR TO WATER TIGHTNESS TESTING.
- SEALANT SHALL BE SIKA CORPORATION; SIKAFLEX-2CNS (FOR GRADE NS, CLASS 25), SIKAFLEX-2CSL OR EQUAL.

JOINT SEALANT DETAIL

N.T.S.

BAR SIZE #	MINIMUM** CLEAR BAR SPACING (INCHES)	EMBEDMENT LENGTH, L _e		CLASS B SPLICE LENGTH	
		OTHER BARS (INCHES)	TOP BAR* (INCHES)	OTHER BARS (INCHES)	TOP BAR* (INCHES)
3	3	12	12	16	16
4	3	12	15	16	20
5	4	15	19	19	25
6	5	18	23	23	30
7	5	25	33	33	43
8	6	29	37	38	49
9	6	36	46	47	61
10	6	44	57	58	75
11	9	53	68	69	90

* TOP BARS ARE HORIZONTAL BARS IN BEAMS AND SLABS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.

** WHEN THE MINIMUM CLEAR BAR SPACING IS MET, STAGGERING OF SPLICES IS NOT REQUIRED.

THE EMBEDMENT AND SPLICING LENGTHS IN TABLE 3 ARE BASED ON THE PROVISIONS OF ACI 318, 2008 SECTIONS 12.2.3 AND 12.15.1 ASSUMING UNCOATED REINFORCEMENT, NORMAL WEIGHT CONCRETE, CONCRETE COVER CONSISTENT WITH THE REQUIREMENTS OF THIS DRAWING, AND A MINIMUM CLEAR BAR SPACING OF 2 D_b. CONDITIONS THAT ARE DIFFERENT FROM THOSE ASSUMED REQUIRE LONGER LAP LENGTHS CONSISTENT WITH ACI 318.

CONCRETE NOTES:

- ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI 301 SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS, LATEST EDITION, ACI 350, LATEST EDITION, AND TO ACI-318 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE. CONCRETE STRENGTH TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI-318, CHAPTER 5.
- CONCRETE AND REINFORCEMENT SHALL BE DESIGNED AND PLACED IN ACCORDANCE WITH ACI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE ACI-318, LATEST EDITION. ACI-305 "HOT WEATHER CONCRETING" AND ACI-306 "COLD WEATHER CONCRETING" SHALL BE FOLLOWED.
- REFER TO SPECIFICATION SECTION 03 30 00 FOR CONCRETE PARAMETERS.
- AGGREGATES SHALL BE CRUSHED STONE CONFORMING TO "SPECIFICATION FOR CONCRETE AGGREGATES" ASTM C33.
- WATER USED IN MIXING CONCRETE SHALL CONFORM TO ASTM C1602.
- REINFORCING BARS SHALL BE DEFORMED, INTERMEDIATE GRADE NEW BILLET STEEL CONFORMING TO ASTM A615 INCLUDING SUPPLEMENTARY REQUIREMENTS, GRADE 60. REINFORCEMENT SHALL BE INSPECTED BEFORE CONCRETE IS PLACED.
- CONCRETE PROTECTION FOR REINFORCEMENT - CLEAR DISTANCE FROM FACE OF CONCRETE TO BAR SHALL BE AS FOLLOWS UNLESS NOTED:
A. CONCRETE DEPOSITED AGAINST GROUND OR VOID FORM: 3".
B. CONCRETE SURFACES EXPOSED TO WEATHER OR IN CONTACT WITH GROUND AFTER REMOVAL OF FORMS: 2" (2.5" FOR PRIMARY REINF)
- JOINT SEALANT FOR ALL CONCRETE CONTROL, CONSTRUCTION AND ISOLATION JOINTS SHALL BE SIKAFLEX-1A BY SIKA CORP., OR APPROVED EQUAL.
- GROUT USED FOR VARIOUS APPLICATIONS SHALL BE AS FOLLOWS:
A. GROUT USED FOR STRUCTURAL STEEL / COLUMN BASE PLATES SHALL BE PREPACKED, HIGH-FLUIDITY NON-SHRINK NATURAL AGGREGATE GROUT SUCH AS "MASTERFLOW 713 PLUS" BY BASF (FORMERLY MASTER BUILDERS) OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION. SPACE BETWEEN THE ANCHOR BOLTS AND OVERSIZED HOLES IN THE BASE PLATE SHALL BE FULLY GROUTED WITH NON-SHRINK GROUT TO ASSURE PROPER SHEAR TRANSFER. GROUTING SHALL BE PERFORMED ONE BOLT AT A TIME, WHILE OTHER BASE PLATE BOLTS ARE FULLY TIGHTENED.
B. GROUT USED FOR GROUTING COMPRESSORS, TURBINES, LARGE PUMPS AND OTHER RECIPROCATING OR ROTATING EQUIPMENT THAT REQUIRES EPOXY GROUTING SHALL BE "FIVE-STAR HP" EPOXY GROUT BY FIVE STAR PRODUCTS, INC., OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION.
C. GROUT USED FOR DRILLED AND EPOXY GROUTED REBAR SHALL BE HILTI HIT RE500 EPOXY OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION.
- VOID FORM MATERIAL SHALL BE BY "SURE VOID" OR APPROVED EQUAL. KEEP VOID FROM MATERIAL DRY DURING PLACEMENT AND INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. VOID FORM SHALL BE BIODEGRADABLE AND CAPABLE OF SUPPORTING THE FLUID WEIGHT OF THE CONCRETE.
- ALL WELDING PROCEDURES, INCLUDING STUD WELDING, AND QUALIFICATIONS SHALL BE IN ACCORDANCE WITH AWS D1.1.
- ALL SLABS SHALL BE GIVEN A FLOAT FINISH AS DESCRIBED IN ACI 301. ALL WALKS AND EXTERIOR SLABS SHALL RECEIVE A POWERED STEEL TROWEL FINISH AFTER CONCRETE HAS RECEIVED A FLOAT FINISH.
- EXPOSED CORNERS SHALL BE CHAMFERED 3/8" UNLESS NOTED.
- CHECK ALL ELECTRICAL, MECHANICAL AND PIPING DRAWINGS FOR EMBEDDED ITEMS (PIPE, CONDUIT, ETC.) AND BLOCKOUTS BEFORE PLACING CONCRETE.
- IF REINFORCING OR MESH IS FIELD CUT FOR SMALL OPENINGS, CONDUIT, ELECTRICAL BOXES, ETC., CUT REINFORCING SHALL BE REPLACED WITH ANY EQUIVALENT AREA OF STEEL. ALL SUCH BARS SHALL EXTEND 24" MINIMUM (OR MESH LAP 2") BEYOND CORNER OR EDGE OF OPENING IF NECESSARY. REINFORCING SHALL BE BENT TO PROVIDE THIS MINIMUM EMBEDMENT. MAKE ALL BARS CONTINUOUS AROUND CORNERS.
- THE CONTRACTOR SHALL VERIFY ALL EQUIPMENT ANCHOR BOLT DIMENSIONS AGAINST THE CERTIFIED EQUIPMENT DRAWINGS BEFORE PLACING CONCRETE. TOLERANCES FOR ANCHOR BOLT LOCATIONS AND ELEVATIONS SHALL BE AS DEFINED IN THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) CODE OF STANDARD PRACTICE.

GENERAL NOTES:

- PLEASE REFER TO TECHNICAL SPECIFICATION 02 32 00, SUBSURFACE INVESTIGATIONS FOR LOGS OF BORINGS AND TEST PITS, INTERPRETED GEOPHYSICAL PROFILES, AND GEOTECHNICAL LABORATORY TEST RESULTS.
- DO NOT SCALE MEASUREMENTS OFF DRAWINGS. ONLY USE LABELED DIMENSIONS.

LEGEND

- X PROPOSED FENCE
- CF EXISTING CHEMICAL FEED
- E EXISTING ELECTRICAL
- X EXISTING FENCE
- FO EXISTING FIBER OPTIC
- GUY EXISTING GUY WIRE
- OH EXISTING OVERHEAD ELECTRIC
- SD EXISTING STORM DRAIN
- W EXISTING WATER LINE
- - - SURVEY BOUNDARY
- - - ST LOUIS TUNNEL (APPROXIMATE ONLY)
- 8850- EXISTING MAJOR CONTOUR
- - - EXISTING MINOR CONTOUR
- 8850- PROPOSED MAJOR CONTOUR
- 8847- PROPOSED MINOR CONTOUR
- 8850- - - PROPOSED MAJOR CONTOUR BY OTHERS
- 8847- - - PROPOSED MINOR CONTOUR BY OTHERS

ABBREVIATIONS

- CF CHEMICAL FEED
- CHV CORE HOLE VERTICAL (MONITORING WELL)
- CI CAST IRON
- CLR CLEAR / CLEARANCE
- CMP CORRUGATED METAL PIPE
- CP CONTROL POINT
- CPP CORRUGATED PLASTIC PIPE
- CY CUBIC YARDS
- E EASTING
- EL/ELEV ELEVATION
- ELEC ELECTRIC/ELECTRICAL
- EWD ENHANCED WETLANDS DESIGN
- EX EXISTING
- FES FLARED END SECTION
- FT FEET
- FO FIBER OPTIC
- HORIZ HORIZONTAL
- HT HEIGHT
- INV INVERT
- LF LINEAR FEET
- MAX MAXIMUM
- MH MANHOLE
- MIN MINIMUM
- MW MONITORING WELL
- N NORTHING
- N/A NOT APPLICABLE
- O.C. ON CENTER
- OH OVERHEAD ELECTRIC
- OU OPERABLE UNIT
- PVC POLY VINYL CHLORIDE
- RCP REINFORCED CONCRETE PIPE
- RM REFRACTION MICROTREMOR GEOPHYSICAL LINE
- RS RESISTIVITY SURVEY LINE
- SD STORM DRAIN
- SS STAINLESS STEEL
- STA STATION
- TBD TO BE DETERMINED
- TOC TOP OF CONCRETE
- TOP TOP OF PIPE
- TP TEST PIT
- TYP TYPICAL
- W/ WITH
- VERT VERTICAL

PROJECT

RICO-ARGENTINE
SITE-OU01

ST LOUIS TUNNEL
HYDRAULIC
CONTROLS
STAGE 2

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REGISTRATION

ISSUE/REVISION

0	JUNE 19, 2015	FINAL DESIGN
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60337634

SHEET TITLE

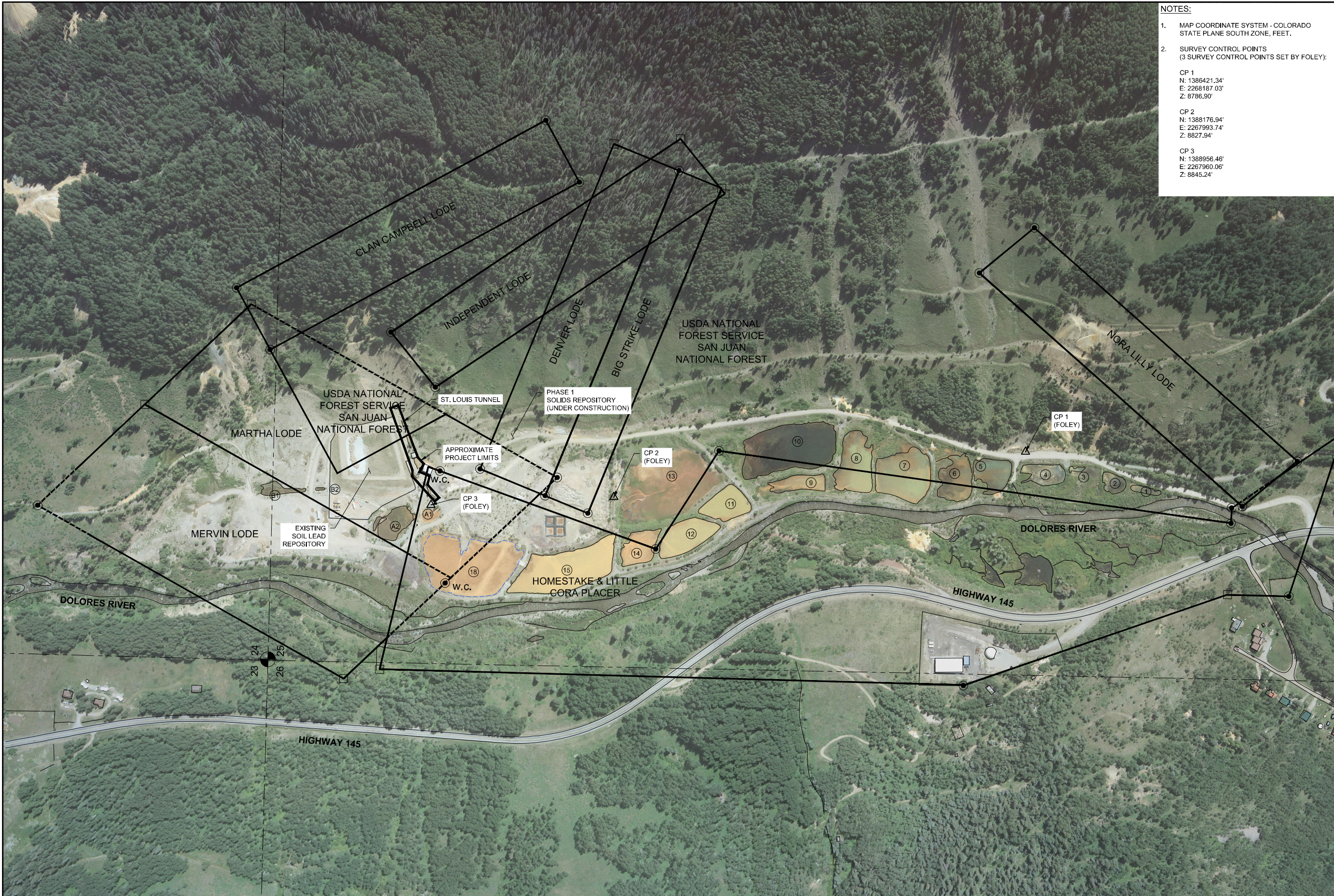
NOTES, LEGEND & ABBREVIATIONS

SHEET NUMBER

G-110

2 OF 11

ANSI D 22" x 34"



- NOTES:
1. MAP COORDINATE SYSTEM - COLORADO STATE PLANE SOUTH ZONE, FEET.
 2. SURVEY CONTROL POINTS (3 SURVEY CONTROL POINTS SET BY FOLEY):

CP 1
N: 1386421.34'
E: 2268187.03'
Z: 8786.90'

CP 2
N: 1388176.94'
E: 2267993.74'
Z: 8827.94'

CP 3
N: 1388956.46'
E: 2267960.06'
Z: 8845.24'

AECOM

PROJECT
**RICO-ARGENTINE
SITE-OU01**

**ST LOUIS TUNNEL
HYDRAULIC
CONTROLS
STAGE 2**

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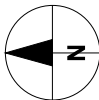
SHEET TITLE
LAND OWNERSHIP & SURVEY
CONTROL POINT PLAN

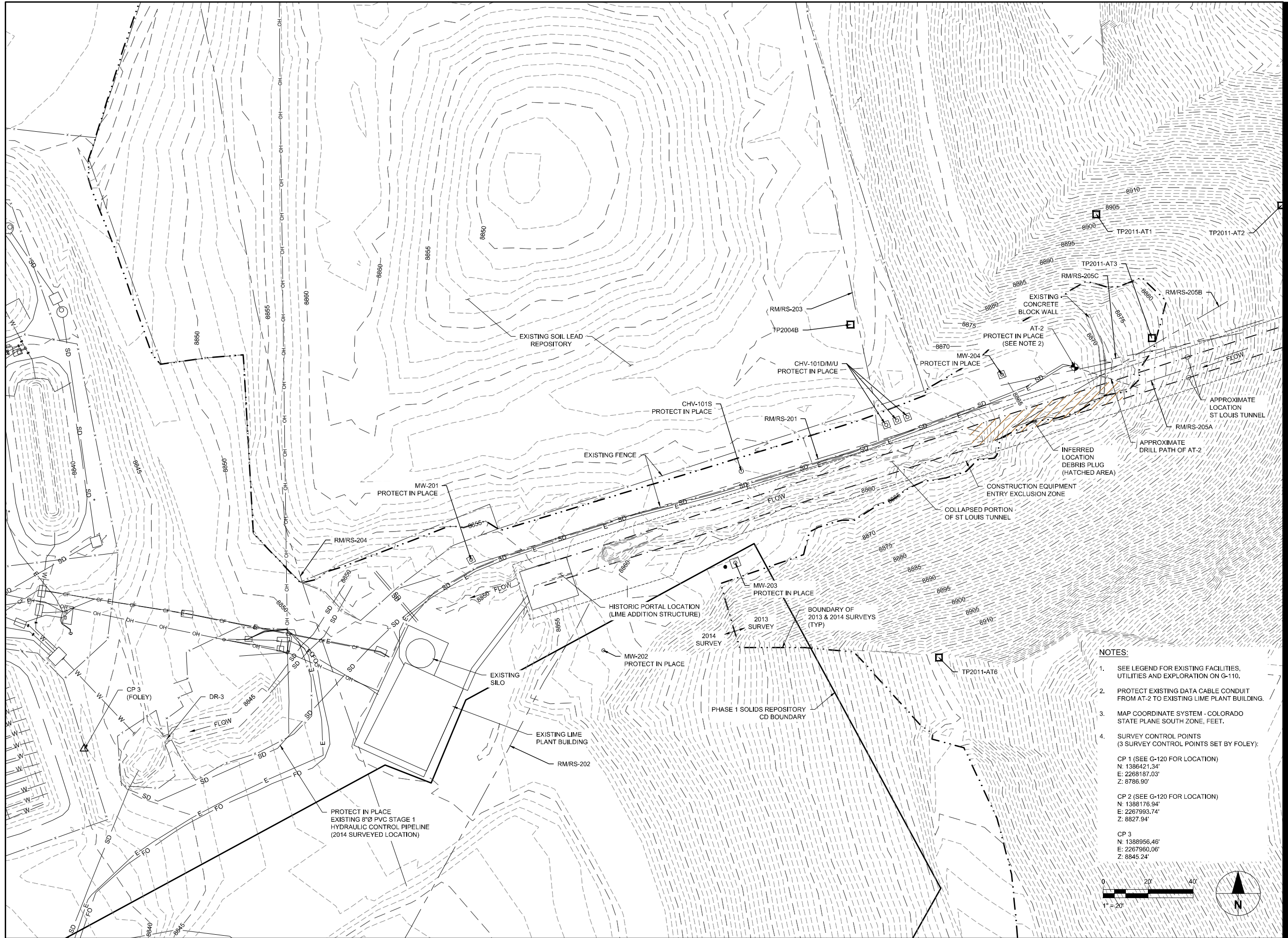
SHEET NUMBER
G-120

LAND OWNERSHIP & SURVEY CONTROL POINT PLAN

Scale: 1:200
(on ANSI D 22"x34")

0 200' 400' 800'



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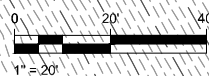
NOTES:

- SEE LEGEND FOR EXISTING FACILITIES, UTILITIES AND EXPLORATION ON G-110.
- PROTECT EXISTING DATA CABLE CONDUIT FROM AT-2 TO EXISTING LIME PLANT BUILDING.
- MAP COORDINATE SYSTEM - COLORADO STATE PLANE SOUTH ZONE, FEET.
- SURVEY CONTROL POINTS (3 SURVEY CONTROL POINTS SET BY FOLEY):

CP 1 (SEE G-120 FOR LOCATION)
N: 1386421.34'
E: 2268187.03'
Z: 8786.90'

CP 2 (SEE G-120 FOR LOCATION)
N: 1388176.94'
E: 2267993.74'
Z: 8827.94'

CP 3
N: 1388956.46'
E: 2267960.06'
Z: 8845.24'



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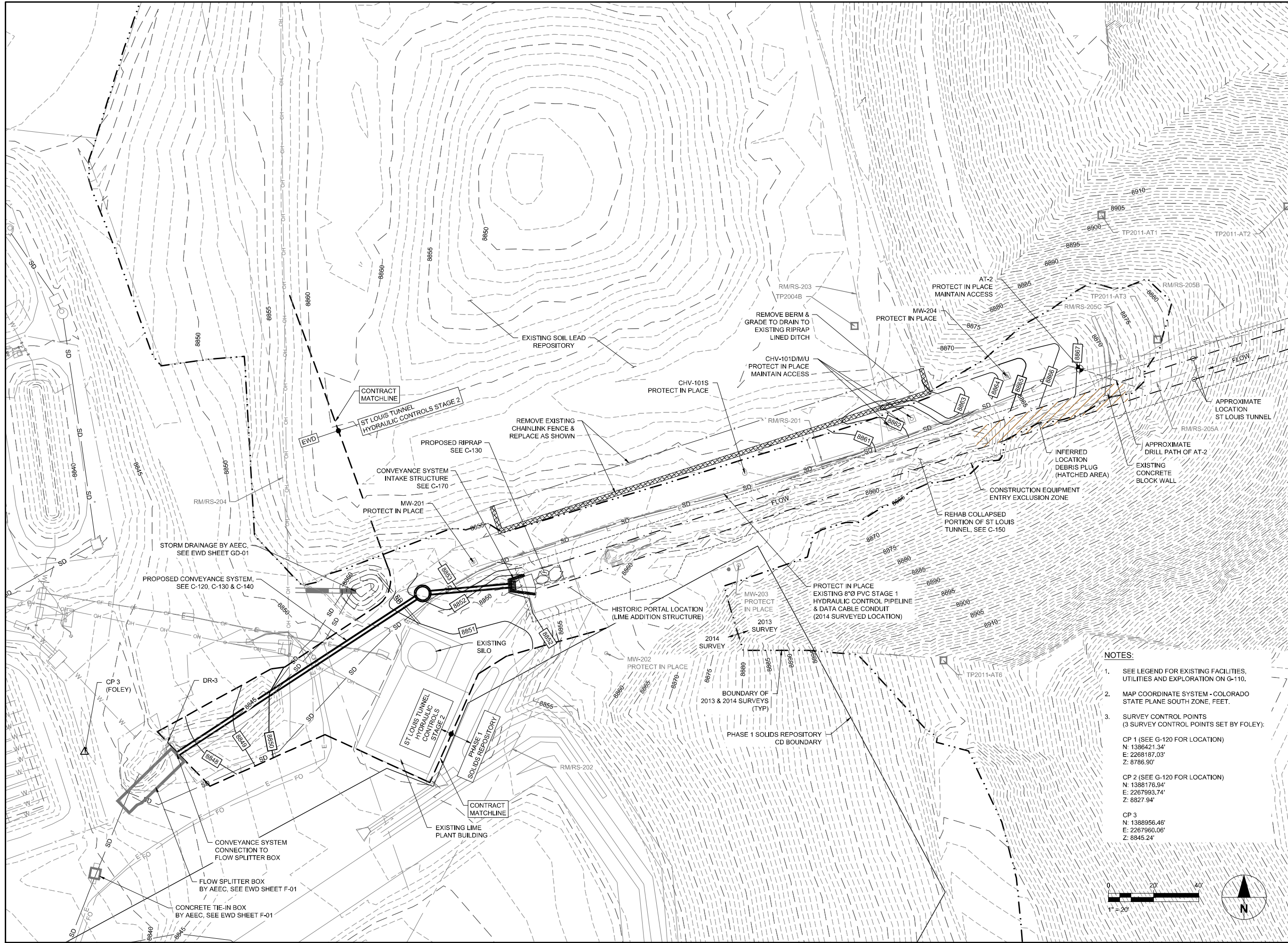
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EXISTING SITE, UTILITIES & PRIOR
EXPLORATION PLAN

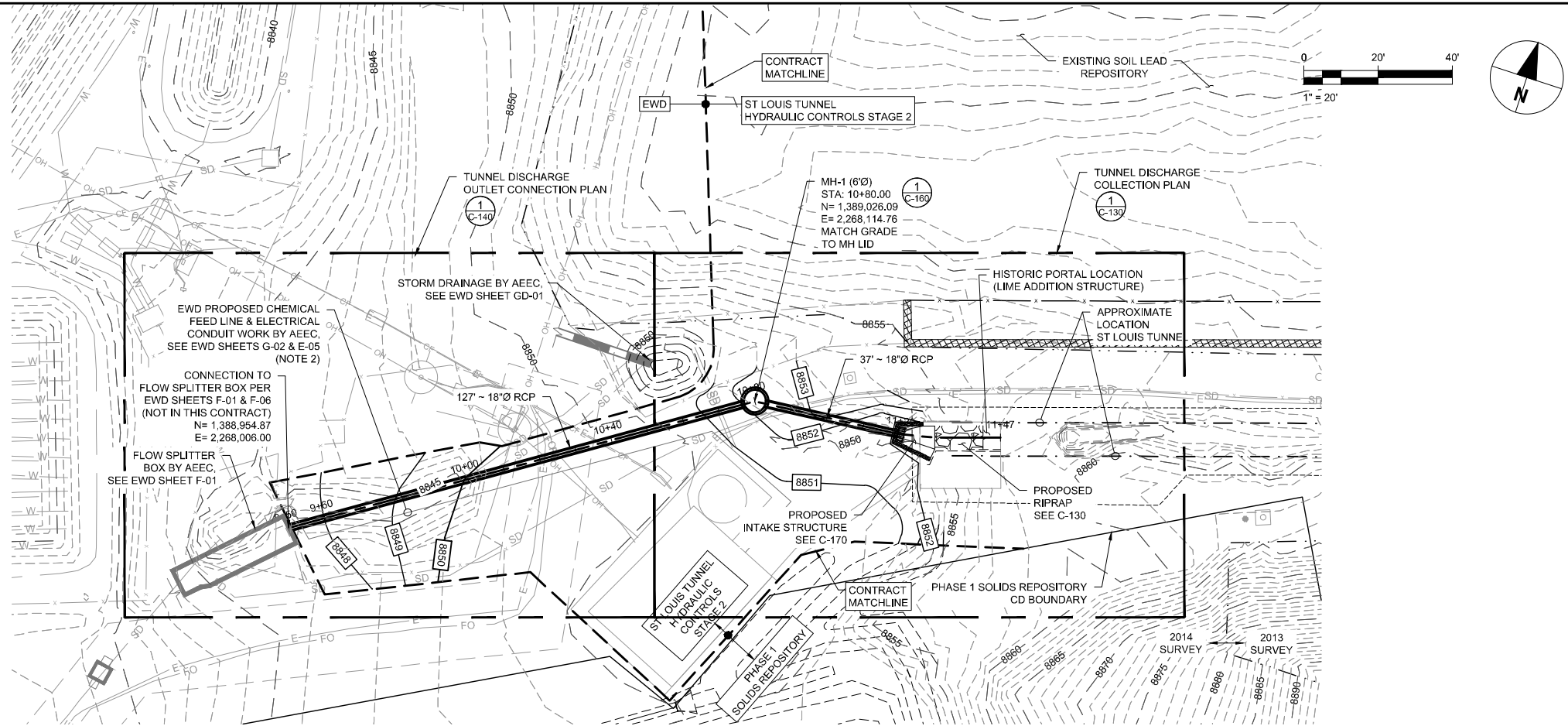
SHEET NUMBER

C-100

4 OF 11

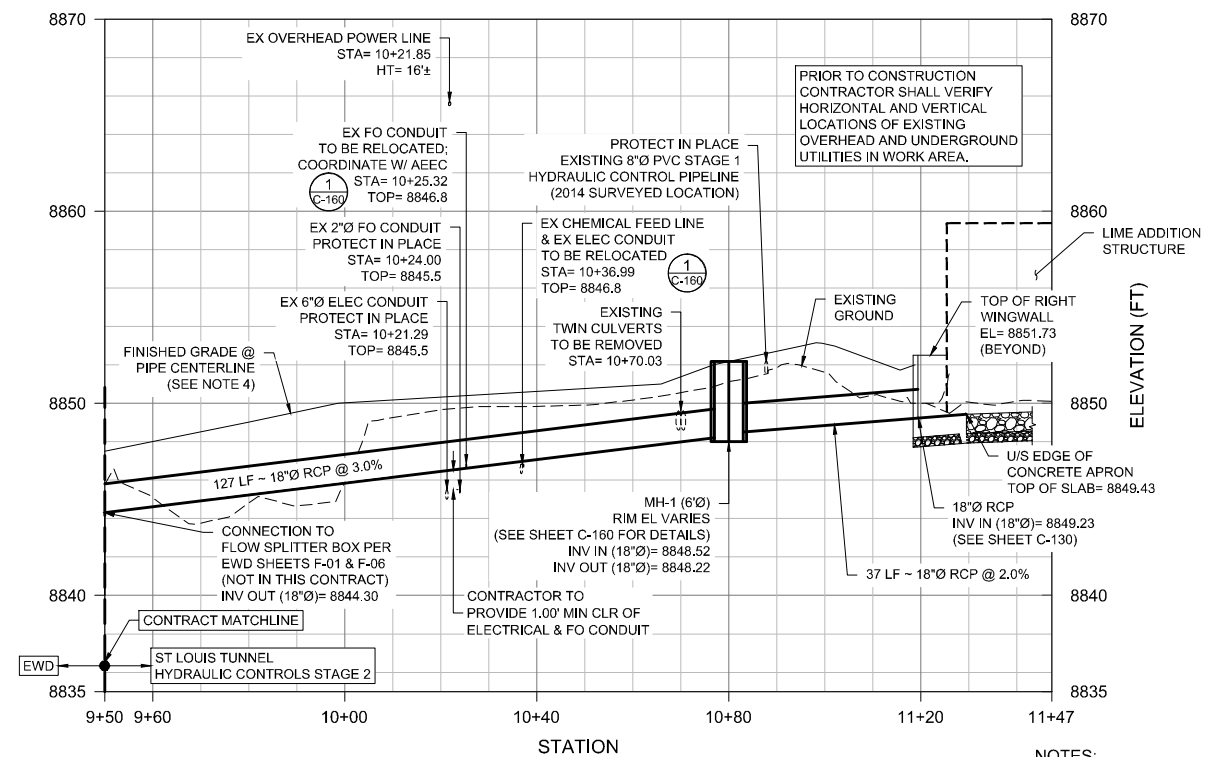


0	JUNE 19, 2015	FINAL DESIGN
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TUNNEL DISCHARGE CONVEYANCE PLAN

Scale: 1" = 20'

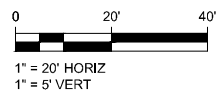


TUNNEL DISCHARGE CONVEYANCE PROFILE

Scale: 1" = 20' HORIZ, 1" = 5' VERT

NOTES:

1. CONTRACTOR TO PROVIDE APPROPRIATE CLEARANCE FOR UTILITIES.
2. PROPOSED CHEMICAL FEED LINE AND ELECTRICAL CONDUIT WORK TO BE DONE BY OTHERS AT THEIR CONVENIENCE (CHEMICAL FEED LINE TO BE ROUTED UNDER CONVEYANCE PIPE NEAR FLOW SPLITTER BOX).
3. PIPE LENGTHS LABELED ARE ALONG SLOPES SHOWN ON PROFILE FROM INSIDE MANHOLE WALL TO STRUCTURE WALLS AS SHOWN ON REFERENCED DRAWINGS.
4. PROVIDE MINIMUM 18" COVER OVER TOP OF PIPE.



PROJECT

RICO-ARGENTINE
SITE-OU01ST LOUIS TUNNEL
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STAGE 2

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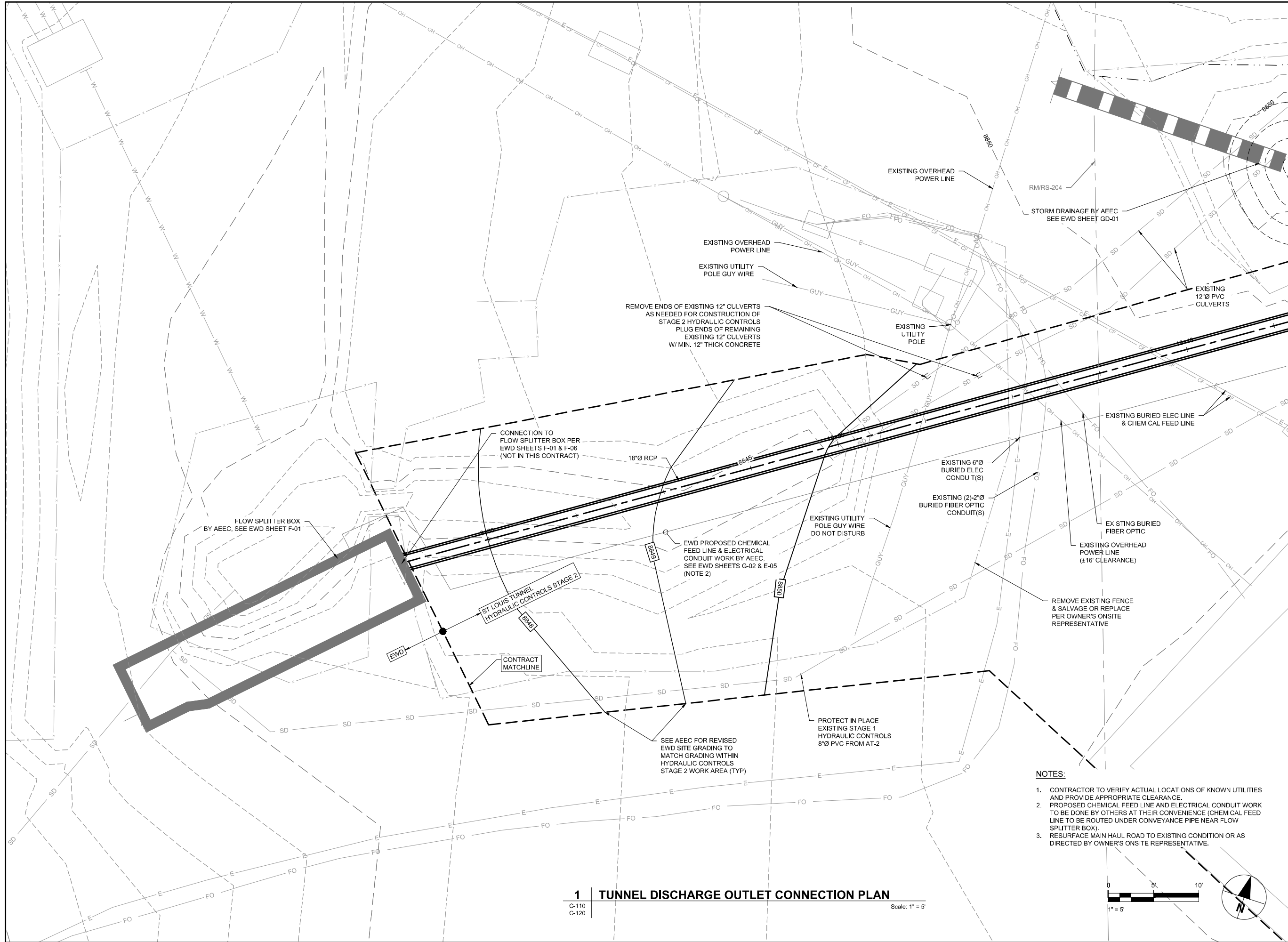
TUNNEL DISCHARGE CONVEYANCE
PLAN & PROFILE

SHEET NUMBER

C-120

6 OF 11

ANSI D 22" x 34"



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PROJECT

RICO-ARGENTINE
SITE-OU01

ST LOUIS TUNNEL
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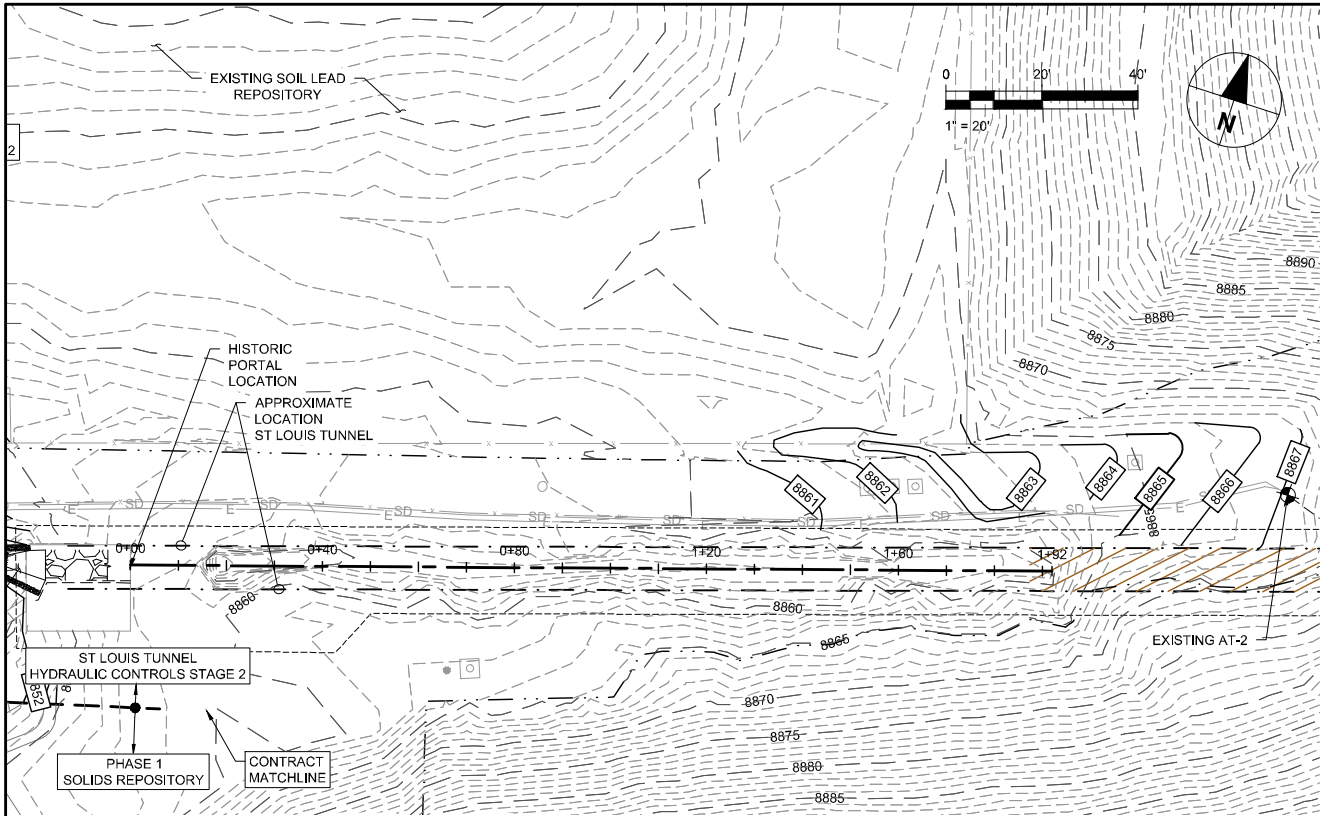
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TUNNEL DISCHARGE
OUTLET CONNECTION PLAN

SHEET NUMBER

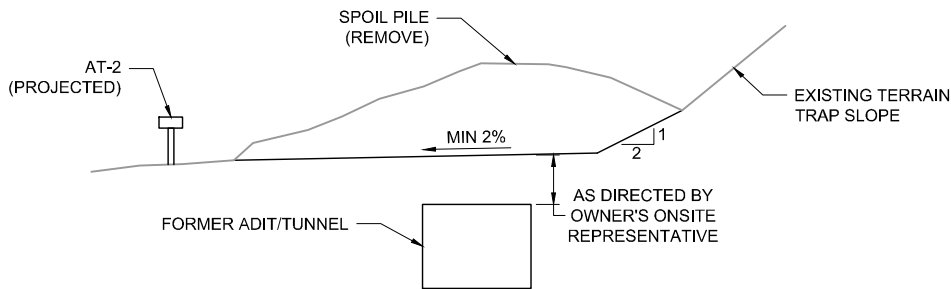
C-140

8 OF 11



COLLAPSED AREA PLAN

Scale: 1" = 20'

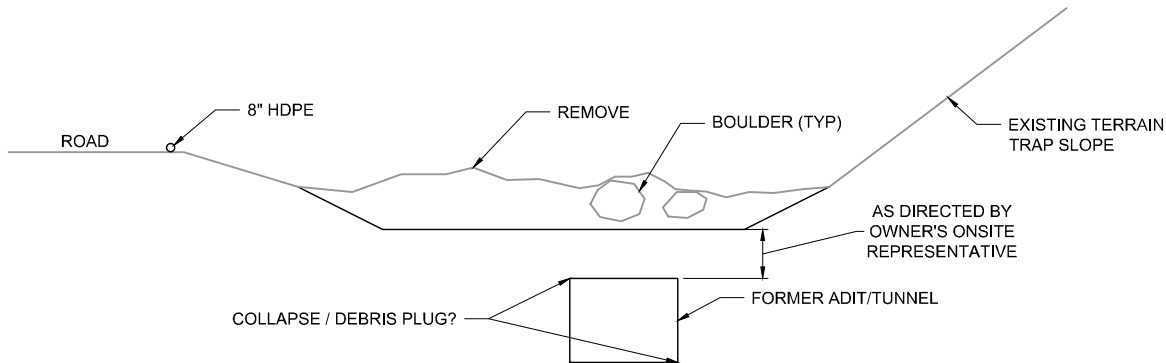


**DEBRIS PLUG UNLOAD
STA 1+92 TO AT-2**

4

VIEW
EAST

Scale: NTS



**COLLAPSE / DEBRIS PLUG UNLOAD
STA 1+54 TO STA 1+68**

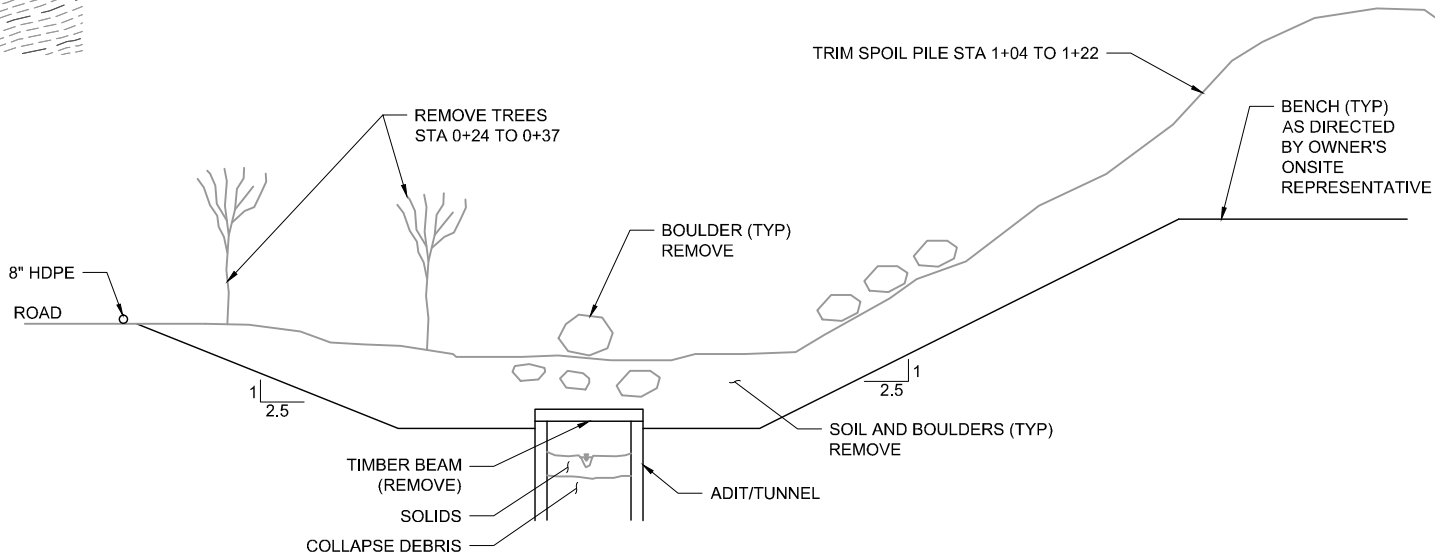
3

VIEW
EAST

Scale: NTS

**ALL WORK SHOWN ON THIS SHEET TO BE DIRECTED
BY OWNER'S ONSITE REPRESENTATIVE**

RICO SLT HYDRAULIC CONTROLS - STABILIZATION UPSTREAM OF SLT PORTAL						
STATIONING:	0+00 To 0+10	0+10 To 0+16	0+16 To 0+24	0+24 To 0+37	0+37 To 0+47	0+47 To 0+79
TYPICAL SECTION NUMBER:	NOT SHOWN IN SECTION	NOT SHOWN IN SECTION	SECTION 2	SECTION 2	SECTION 2	SECTION 1
UPGRADE INSTRUCTIONS:	PRESERVE RAILROAD CROSSING. REMOVE SOIL/TREES FROM TOP OF BRIDGE. TRIM SOIL PILE ON NORTH SIDE OF BRIDGE.	REMOVE SOIL FROM ATOP TIMBER BEAMS AND SLOPE BANK EITHER SIDE	SELECT AND CAREFUL REMOVAL OF SOIL AND TIMBER BEAMS	SAG AREA. REMOVE TREES AND SOIL FROM ATOP SAG. SLOPE BANK AWAY FROM ADIT/TUNNEL ON EITHER SIDE. ASSESS REMOVAL FEASIBILITY OF TIMBER BEAMS UPON SOIL REMOVAL.	REMOVE TREES, PIPES, CROSS TIMBERS SLOPE BANK EITHER SIDE TO 2.5H:1V	REMOVE STRAY TIMBER BEAMS, SURFACE BOULDERS (LARGER THAN 12") STA 0+61 TO 0+73: REMOVE ~1' SOIL FROM BEHIND VERTICAL TIMBER POSTS & LAGGING
STATIONING:	0+79 To 1+01	1+01 To 1+48	1+48 To 1+54	1+54 To 1+68	1+68 To 1+92	1+92 To AT-2
TYPICAL SECTION NUMBER:	SECTION 2	SECTION 2	SECTION 2	SECTION 3	-	SECTION 4
UPGRADE INSTRUCTIONS:	REMOVE SURFACE BOULDERS, REMOVE SOIL FROM ATOP TIMBER BEAMS, REMOVE LATERAL SOIL LOAD ON VERTICAL TIMBER BEAMS & LAGGING, REMOVE TIMBER BEAMS, SLOPE BANKS TO 2.5H:1V	SAME AS 0+79 TO 1+01 EXCEPT ONLY SCATTERED TIMBER BEAMS TO BE REMOVED. 1+04: PLACE BOULDERS TO BLOCK VEHICLES ON SOUTH BANK. 1+04 TO 1+22: TRIM BACK SPOIL PILE SOUTH BANK	SAME AS 0+79 T 1+01	CAREFULLY REMOVE SOIL\BOULDER LOAD ON COLLAPSED AREA	LEAVE AS IS	REMOVE SOIL\BOULDER LOAD FROM SOUTH BANK OVER DEBRIS PLUG

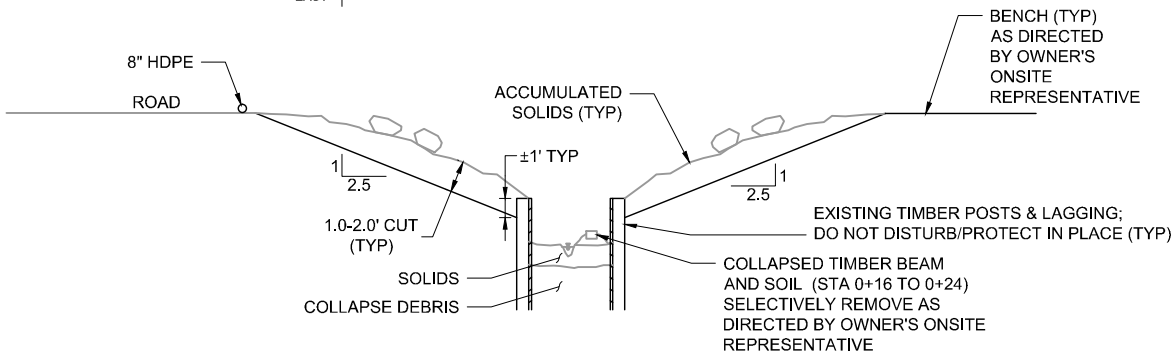


**TIMBER BEAM REMOVAL &
VERTICAL TIMBER POST & LAGGING STABILIZATION
STA 0+24 TO STA 0+47
STA 0+79 TO STA 1+54**

2

VIEW
EAST

Scale: NTS



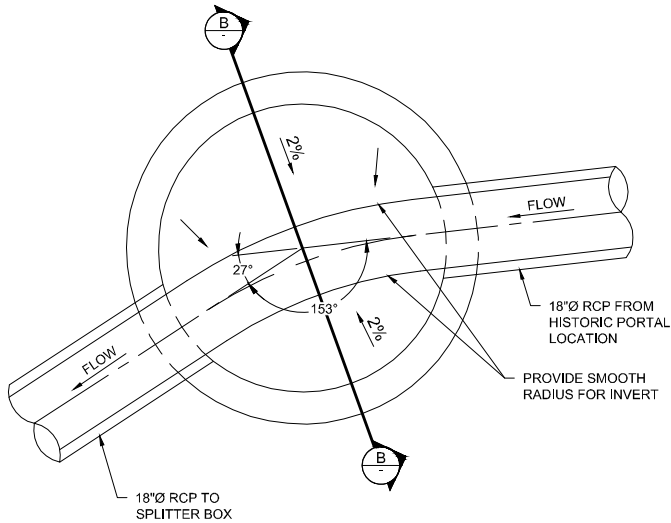
**VERTICAL TIMBER POST & LAGGING STABILIZATION
STA 0+47 TO STA 0+79**

1

VIEW
EAST

Scale: NTS

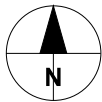
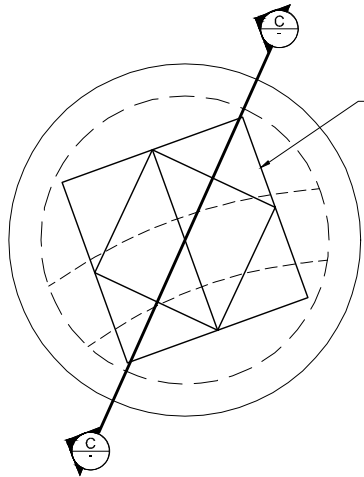
I/R	DATE	DESCRIPTION
0	JUNE 19, 2015	FINAL DESIGN



1 MANHOLE #1 PLAN

C-110
C-120

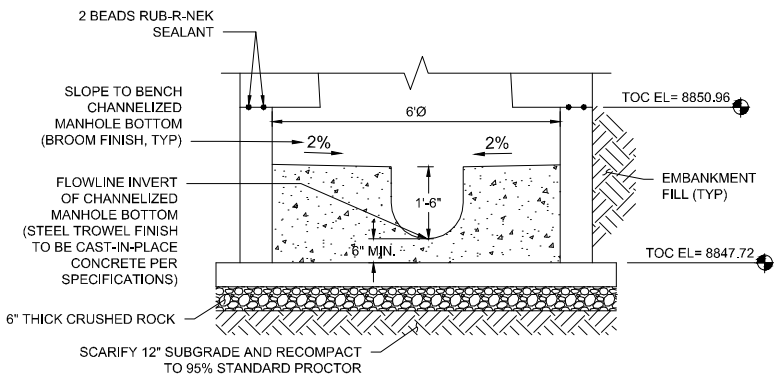
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3 MANHOLE #1 LID PLAN

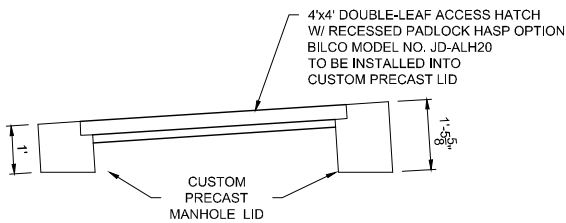
C-110
C-120

Scale: 1" = 2'



B-B MANHOLE #1 SECTION

Scale: 1" = 2'

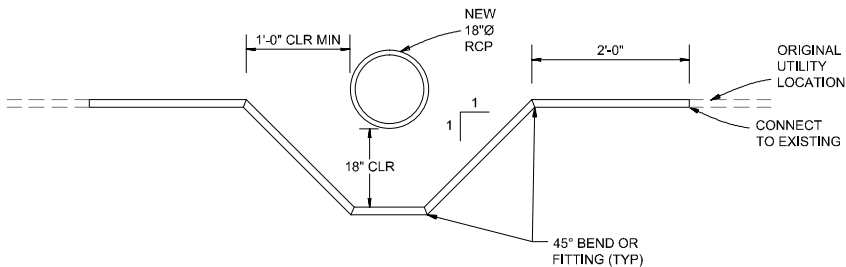


C-C MANHOLE #1 LID SECTION

Scale: 1" = 2'

NOTE:

SECTION CUT PERPENDICULAR TO SLOPE OF FINAL GRADE (MAXIMUM SECTION).



2 TYPICAL UTILITY LOWERING DETAIL

PROJECT

RICO-ARGENTINE
SITE-OU01

ST LOUIS TUNNEL
HYDRAULIC
CONTROLS
STAGE 2

CLIENT

ATLANTIC
RICHFIELD
COMPANY

CONSULTANT

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REGISTRATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	JUNE 19, 2015	FINAL DESIGN

PROJECT NUMBER

60337634

SHEET TITLE

MISCELLANEOUS CIVIL DETAILS

SHEET NUMBER

C-160

10 OF 11

PROJECT

RICO-ARGENTINE
SITE-OU01

ST LOUIS TUNNEL
HYDRAULIC
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SHEET TITLE

INTAKE STRUCTURE DETAILS

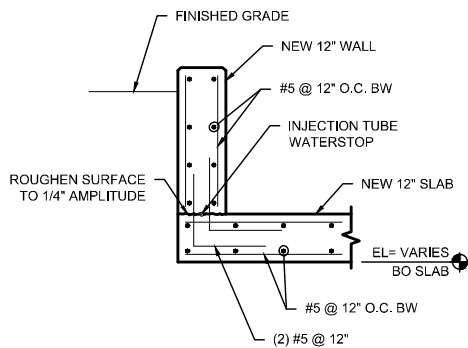
SHEET NUMBER

C-170

11 OF 11

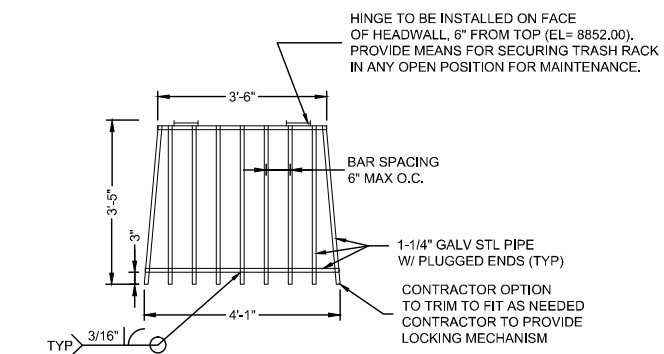
G-G EXISTING STRUCTURE TIE-IN DETAIL

Scale: 1" = 2'



H-H NEW SLAB/WALL TIE-IN DETAIL

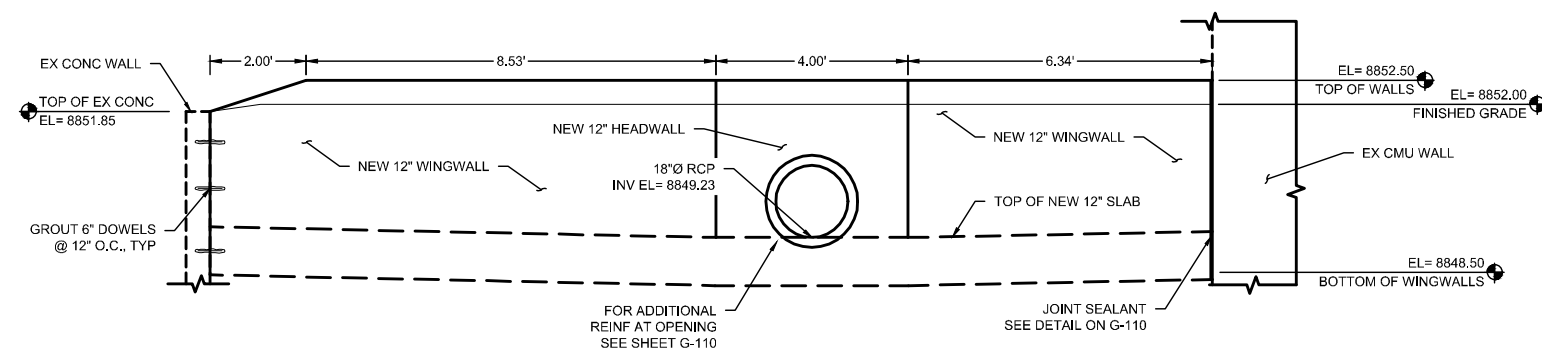
Scale: 1" = 2'



2 TRASH RACK DETAIL

CONTRACTOR TO PROVIDE TRASH RACK
SHOP DRAWINGS FOR REVIEW.

Scale: 1" = 2'

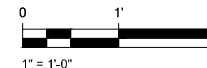
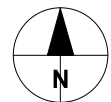


D-D INTAKE STRUCTURE SECTION

Scale: 1" = 2'

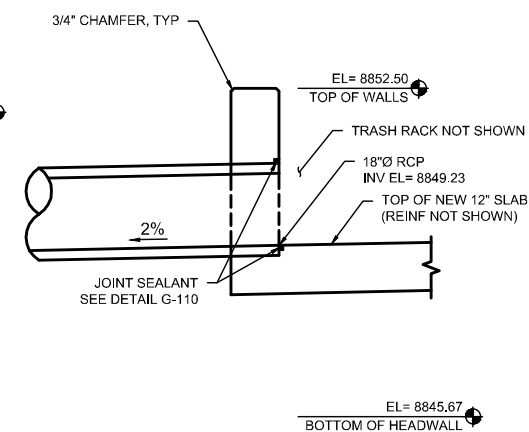
1 INTAKE STRUCTURE

Scale: 1" = 1'-0"



NOTES:

- ALL SURVEY POINTS TO BE VERIFIED IN FIELD PRIOR TO CONSTRUCTION.
- CONTRACTOR TO CHECK FOR OBSTRUCTIONS BEFORE FORMING & CONTACT ENGINEER IF THE GEOMETRY SHOWN NEEDS MODIFICATION.



E-E PIPE PENETRATION SECTION

Scale: 1" = 2'

F-F TOE WALL & BEDDING DETAIL

SEE NOTE 2

Scale: 1" = 2'

